New Alliance Creates Mouse Genomics Lab

The School of Veterinary Medicine’s connection with the new world of genomics was underscored June 26 when UC Davis and The Jackson Laboratory held the joint symposium “Advances in Biomedical Research through Mouse Biology.” The symposium took place the same day representatives of government and private enterprise announced completion of a “rough draft” of the human genome.

In a campus-wide, cross-disciplinary collaboration, the not-for-profit Jackson Laboratory (JAX) of Bar Harbor, Maine, has joined UC Davis in establishing a facility capable of breeding and housing up to 20,000 genetically modified mice. The 10,000-square-foot facility has been remodeled at a cost of $2.8 million shared by both institutions.

New mouse strains will be developed by the UC Davis Murine Targeted Genomics Laboratory. Unique features of the separate mouse housing quarters include specialized air filtration systems and other built-in precautions of biologically secure facilities designed to reduce contamination and prevent infection.

Scientists have already begun studying the human genome to learn how genetic material functions “in concert” within living systems. Mice are a key component in the study of human diseases such as cancer, diabetes, atherosclerosis and neurological disorders because they share genetic similarities with humans and other mammals.

Dr. Kent Lloyd, director of the UC Davis Murine Targeted Genomics Laboratory and an associate professor at the School of Veterinary Medicine, says that, because of its importance in comparative genetic research, “Within the next two years, we’ll have completed the mouse genome.”

Dr. Lloyd says School of Veterinary Medicine faculty and other scientists working at the facility will create new strains of genetically modified mice, conduct new genetic studies using mice as models of human and animal disease, and provide the utmost in laboratory animal health care for genetically modified mice. “JAX West” will manage the mouse housing section of the facility, which will provide mice to researchers at UC Davis and scientists throughout the region.

—Lynn Narlesky

DNA Testing Verifies Thoroughbred Pedigrees

The Veterinary Genetics Laboratory (VGL) has teamed with United States horse racing’s most influential organization, the Jockey Club, to provide highly accurate, DNA-based verification of Thoroughbred horse pedigrees throughout North America.

The VGL is one of three facilities assisting the Jockey Club—holders of the prestigious American Stud Book—with its major transition in parentage testing from traditional blood-typing analysis to DNA-typing. The genetic patterns revealed by DNA-typing are so distinctive that incorrect parentage of a foal can be determined with 99.9 percent accuracy.

The VGL is DNA-typing breeding stock already identified by blood type. Ten-thousand Thoroughbred blood samples stored at the VGL have been DNA-typed this year and another 5–10 thousand will be completed by the end of 2000. These will be used for DNA-based parentage verification with next year’s foal crop, which will be DNA-typed from hair samples. Hair samples are more simple to gather, ship and store than are blood samples. Hair kits containing mane hair from breeding stock with no stored samples at the VGL are already arriving at the lab for DNA extraction.

The Veterinary Genetics Laboratory has pioneered many DNA-based tools for parentage, positive breed trait (such as coat color), and disease “testing” in numerous domestic and wildlife species. The lab now provides testing services for more than 60 breed registries. By the end of 2001, virtually all parentage testing services of the laboratory will involve DNA technology. Related research activities include contributions to the genome map of the horse, which School of Veterinary Medicine faculty believe will add to the store of knowledge about inherited disease—and its prevention—in horses.